



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,666	02/05/2002	Takashi Hiroi	501.41125X00	4688
20457	7590	09/08/2004	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			FERNANDEZ, KALIMAH	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 09/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

UK

<b>Office Action Summary</b>	<b>Application No.</b> 10/062,666	<b>Applicant(s)</b> HIROI ET AL.	
	<b>Examiner</b> Kalimah Fernandez	<b>Art Unit</b> 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2,3,5,6,10-16 and 20-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,5,6,10-16 and 20-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119.**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-3,5-6 and 12-16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Pat No 6,047,083 issued to Mizuno.

3. Mizuno discloses irradiating either a charged particle or a light on a surface of a substrate on which a pattern is formed (col.5, lines 5-14).

4. Mizuno discloses obtaining an image of said substrate surface by detecting secondary electrons generated from said substrate as a result of the irradiation (col.3, line 66- col.4, line 8).

5. Mizuno discloses producing a digital image by subjecting the produced image signal to A/D conversion (col.6, lines 37-39).

6. Mizuno discloses comparing the digital image with a reference image stored in a memory (col.3, lines 44-53).

7. Mizuno discloses outputting information of the extracted defect candidate including image of the extracted defect candidate (col.5, lines 29-32).
8. Mizuno discloses the defect candidate location data is displayed in map format on said screen (col.6, lines 53-58).
9. Mizuno discloses displaying the image of the defect candidate on said screen (col.6, lines 44-52).
10. Mizuno discloses designating the defect candidate location data displayed in a map format on the displayed map, and thereby simultaneously displaying an image of a defect candidate corresponding to the designated location on the screen (see for example col.7, lines 18-30). Namely, Mizuno discloses the normalized defect image(s) being overwritten on the specified points on the wafer (see fig.6a-b), wherein the normalization method is described in col.6, lines 12-33. Here, the term "an image of a defect" has be broadly interpreted to include any visible representation of the defect.
11. Lastly, one skilled in this art would be taught by the written description of Mizuno to display both the wafer map as depicted in fig. 6a and an defect image because Mizuno implies the ability to display all data

according to the need (col.7, lines 6-11). It is also predictable with a reasonable degree of confidence that the need to view the particular defect represented on the wafer map to confirm the classification may arise.

Therefore, Mizuno establishes a prima facie case of either anticipation or, in the alternative, obviousness.

12. As per claim 2, Mizuno discloses the step of displaying the outputted image of the extracted defect candidate on a display screen (col.5, lines 37-39).

13. As per claim 3, Mizuno discloses said information outputted at the outputting step includes data enabling the classification of the defect (col.3, lines 38-41).

14. As per claim 4, Mizuno discloses the step of displaying in a map format the defect candidate outputted at the step of outputting (col.4, lines 36-40; col.5, lines 8-20). Specifically, Mizuno discloses the generation of a wafer map that is used for imaging any defect candidate in a map format.

15. As per claim 5, Mizuno discloses the step of displaying an image of a defect candidate designated in the map displayed on the screen (col.5, lines 37-39; see fig. 6b).

16. As per claim 6, Mizuno discloses detecting a defect candidate of a pattern by using an inspecting means (col.2, lines 11-30).

17. Mizuno discloses outputting an image of this detected defect candidate and data including location information of the defect candidate via a storage medium (col.6, lines 39-52).

18. Mizuno discloses inputting said defect candidate image and data including location information of the defect candidate outputted via said storage medium to processing means (22) (col.6, lines 41-43; see also col.8, lines 16-55).

19. Mizuno discloses displaying on a screen of the processing means (22) (col.6, lines 41-43).

20. As per claims 12-13, Mizuno discloses a step for displaying on the screen, said defect candidates are classified using the images of defect candidates are classified using the images of defect outputted via said storage medium (col.6, lines 59-67; col.7, lines 32-34). In addition, Mizuno discloses indicating the location of the defect and location data of these classified/designated defect candidates is identified by classification and displaying in map format on said screen (col.7, lines 31-34; fig.6b).

21. As per claim 14, Mizuno discloses identifying said classified defect candidate by location and classification (see fig. 6b; col.7, lines 18-30).

22. As per claim 15, Mizuno discloses the steps of processing the inputted image of the defect candidate and data comprising the location of this defect candidate by the processing means and thereafter outputting via the network (see for example col.7, lines 6-11).

23. As per claim 16, Mizuno discloses imaging a substrate on which a pattern is formed (col.3, lines 19-23).

24. Mizuno discloses processing an image obtained by said imaging to detect a defect candidate of said pattern (col.4, lines 5-8).

25. Mizuno discloses outputting via network (col.6, lines 59-67; col.7, lines 32-34), an image of said detected defect candidate and data location information of the defect candidate while carrying out the step of imaging said substrate and the step of detecting a defect candidate of said pattern (col.5, lines 1-5). Namely, Mizuno discloses the repeating of imaging step and detecting step while outputting an image of said detected defect candidate on a display (col.6, lines 39-67).

26. Mizuno discloses displaying, on a screen, said defect candidate image and data including the location information of the defect candidate outputted via this network (col.7, lines 18-30).

27. Mizuno discloses data of the location information of defect candidate is displaying in map format on said screen (col.7, lines 18-30).

28. Mizuno discloses an image of the defect candidate is displayed in said screen (col.6, lines 32-44).

***Claim Rejections - 35 USC § 103***

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

30. Claims 10-11 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno as applied to claims 6 and 16 above, and further in view of US Pat No 6,539,106 issued to Gallarda et al.

31. Mizuno teaches the claimed invention except for changing threshold value data for detecting defect candidate.



32. As per claims 10-11 and 20-21, Gallarda et al discloses the step of changing threshold value data for detecting defect candidate of said pattern on said pattern and displaying utilizing said changing threshold (i.e. updating the display in accordance with the changing threshold) (col.8, lines 59-60; col.12, lines 37-42).

33. As per claim 22, Gallarda et al discloses defect candidate matching (col.13, line 56-col.14, line 19).

34. As per claims 13 and 23, Gallarda et al discloses defect candidate location data designated from among the classified defect candidate is displayed in map format on said screen (col.16, lines 60-63).

35. As per claim 24, Gallarda et al discloses producing a list or table from among said classified defect candidates are displayed on said screen discriminately from each other in the map format (col.14, lines 58-62).

### ***Response to Arguments***

36. Applicant's arguments filed 8-2-04 have been fully considered but they are not persuasive. Applicant argues that Mizuno does not disclose, "displaying on the screen an image of the defect candidate which is designated on map which displays defect candidate data on the screen."

MPEP 2111 states claims are to be given their broadest reasonable interpretation consistent with the specification. Here, Mizuno discloses designating the defect candidate location data in a wafer map at the same time as displaying an image of the defect, which results from the classification (col.7, lines 18-30). The language of the claim does not exclude "an image of defect" being a representation of the defect as depicted in fig. 6b. Rather the claim language requires the comparison of digital images to output 'an image,' which broadly defined includes the representations as described in Mizuno, which are based on the size and type of defect (see col.6, lines 19-32). Lastly, one skilled in the art would have been taught by Mizuno that displays of both the wafer map of Fig. 6a and a digital image of the defect can be viewed at the same time because it is predictable with a reasonable degree of confidence that the need to view the particular defect represented on the wafer map to confirm the classification may arise. Mizuno implies this possibility of simultaneous display in relation to the inspection image and the reference image (see col.8, lines 62-65).

***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 571-272-2470. The examiner can normally be reached on Mon-Tues 6:30-3:30; Wed-Thurs 8-5 and Fri.9am-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KF

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2011